

**Interactive Classroom**

Glencoe McGraw-Hill

# Pre-Algebra



## Chapter 6

Ratio, Proportion, and Percent

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# Lesson Menu

Five-Minute Check (over Chapter 5)

Main Ideas and Vocabulary

Example 1: Write Ratios in Simplest Form

Example 2: Write Ratios as Fractions

Example 3: Compare Unit Rates

Example 4: Convert Rates

## Main Ideas

- Write ratios as fractions in simplest form.
- Determine unit rates.

## New Vocabulary

- ratio
- rate
- unit rate

**EXAMPLE** Write Ratios in Simplest Form

- 1 Express the ratio *10 roses out of 12 flowers* as a fraction in simplest form.

$$\frac{10}{12} = \frac{5}{6}$$

$\div 2$

$\div 2$

Divide the numerator and denominator by the GCF, 2.

The ratio of roses to flowers is 5 to 6. This means that for every 6 flowers, 5 of them are roses.

**Answer :**  $\frac{5}{6}$

 **CHECK Your Progress**

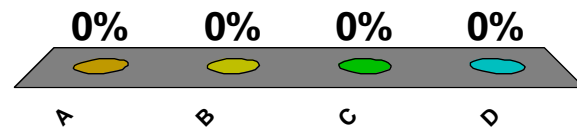
**1** Express the ratio *8 golden retrievers out of 12 dogs* as a fraction in simplest form.

A.  $\frac{3}{2}$

B.  $\frac{4}{6}$

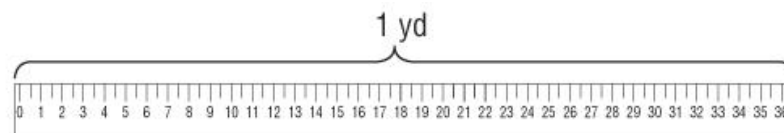
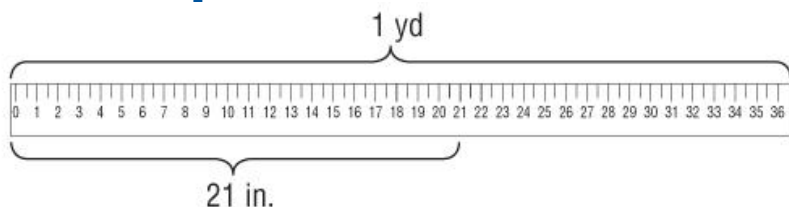
C.  $\frac{8}{12}$

**D.**  $\frac{2}{3}$



**EXAMPLE** Write Ratios as Fractions

- 2** Express the ratio *21 inches to 2 yards* as a fraction in simplest form.



$$\frac{21 \text{ inches}}{2 \text{ yards}} = \frac{21 \text{ inches}}{72 \text{ inches}}$$

$$= \frac{7 \cancel{\text{ inches}}}{24 \cancel{\text{ inches}}}$$

Convert 2 yards to inches.

Divide the numerator and denominator by the GCF, 3.

Written in simplest form, the ratio is 7 to 24.

**Answer :**  $\frac{7}{24}$

 **CHECK Your Progress**

**2** Express the ratio *4 feet to 18 inches* as a fraction in simplest form.

A.  $\frac{2}{9}$

**B.**  $\frac{8}{3}$

C.  $\frac{48}{18}$

D.  $\frac{24}{9}$

0%

A  B  C  D





**Real-World EXAMPLE****Compare Units Rates**

- 3 SHOPPING** A 12-oz bottle of cleaner costs \$4.50. A 16-oz bottle of cleaner costs \$6.56. Which costs less per ounce?

Find and compare the unit rates of the bottles.

$$\begin{array}{r} \div 12 \\ \frac{\$4.50}{12 \text{ ounces}} = \frac{\$0.38}{1 \text{ ounces}} \\ \div 12 \end{array}$$

Divide the numerator and denominator by 12 to get a denominator of 1.

For the 12-oz bottle, the unit rate is \$0.38 per ounce.

**Real-World EXAMPLE****Compare Units Rates****3**

$$\frac{\$6.56}{16 \text{ ounces}} = \frac{\$0.41}{1 \text{ ounce}}$$

$\div 16$

$\div 16$

Divide the numerator and denominator by 16 to get a denominator of 1.

For the 16-oz bottle, the unit rate is \$0.41 per ounce.

**Answer:** The 12-oz bottle has the lower cost per ounce.

 **CHECK** Your Progress

- 3 SHOPPING** A 6-pack of a soft drink costs \$1.50. A 12-pack of a soft drink costs \$2.76. Which pack costs less per can?
- A.** The 12-pack costs less per can.
- B.** The 6-pack costs less per can.
- C.** Both packs cost the same per can.
- D.** Cannot be determined from the given information.

0%

 A  B  C  D

**EXAMPLE** Convert Rates

- 4 ANIMALS** A snail moved 30 feet in 2 hours. How many inches per minute did the snail move?

You will need to convert  $\frac{30 \text{ ft}}{2 \text{ hr}}$  to  $\frac{\blacksquare \text{ in.}}{1 \text{ min}}$ .

There are 12 inches in 1 foot and 60 minutes in 1 hour.

Write 30 feet in 2 hours as  $\frac{30\text{ft}}{2 \text{ hr}}$ .

**EXAMPLE** Convert Rates

$$4 \quad \frac{30 \text{ ft}}{2 \text{ hr}} = \frac{30 \text{ ft}}{2 \text{ hr}} \cdot \frac{12 \text{ in.}}{1 \text{ ft}} \div \frac{60 \text{ min}}{1 \text{ hr}}$$

$$= \frac{30 \text{ ft}}{2 \text{ hr}} \cdot \frac{12 \text{ in.}}{1 \text{ ft}} \cdot \frac{1 \text{ hr}}{60 \text{ min}}$$

$$= \frac{\overset{1}{\cancel{30}} \text{ ft}}{\underset{1}{\cancel{2}} \text{ hr}} \cdot \frac{\overset{3}{\cancel{12}} \text{ in.}}{1 \text{ ft}} \cdot \frac{1 \cancel{\text{hr}}}{\underset{1}{\cancel{60}} \text{ min}}$$

Convert feet to inches and hours to minutes.

The reciprocal of  $\frac{60 \text{ min}}{1 \text{ hr}}$

is  $\frac{1 \text{ hr}}{60 \text{ min}}$ .

Divide the common factors and units.

**EXAMPLE** Convert Rates

4

$$= \frac{3 \text{ in.}}{1 \text{ min}}$$

Simplify.

**Answer:** 30 feet in 2 hours is equivalent to 3 inches per minute.

 **CHECK** Your Progress

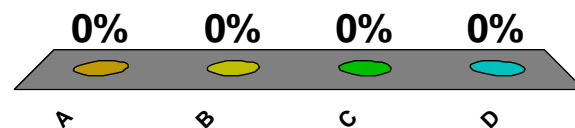
**4** **JOGGING** Dave jogs 2 miles in 22 minutes. How many feet per second is this?

A.  $\frac{11 \text{ ft}}{\text{s}}$

**B.**  $\frac{8 \text{ ft}}{\text{s}}$

C.  $\frac{968 \text{ ft}}{\text{s}}$

D.  $\frac{3 \text{ ft}}{\text{s}}$



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# Lesson Menu

Five-Minute Check (over Lesson 6-1)

Main Ideas and Vocabulary

Example 1: Identify Proportional Relationships

Example 2: Describe Proportional Relationships

## Main Ideas

- Identify proportional and nonproportional relationships in tables and graphs.
- Describe a proportional relationship using an equation.

## New Vocabulary

- proportional
- nonproportional
- constant of proportionality

**EXAMPLE** Identify Proportional Relationships

- 1 A. Determine whether the set of numbers in the pattern forms a proportion.

Baseballs	1	2	3	4
Cost (dollars)	2	3	4	5

$$\frac{1}{2} \neq \frac{2}{3} \neq \frac{3}{4} \neq \frac{4}{5}$$

Answer: no

**EXAMPLE** Identify Proportional Relationships

- 1** B. Determine whether the set of numbers in the pattern forms a proportion.

<b>Time (seconds)</b>	1	2	3	4
<b>Distance (inches)</b>	4	8	12	16

Write the rate of time to distance for each second in simplest form.

$$\frac{1}{4} \quad \frac{2}{8} = \frac{1}{4} \quad \frac{3}{12} = \frac{1}{4} \quad \frac{4}{16} = \frac{1}{4}$$

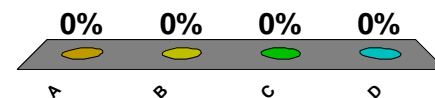
**Answer:** yes


**CHECK Your Progress**

- 1** Determine whether the set of numbers in the table are proportional. Explain your reasoning.

Passes Received	52	40	22	13
Number of Yards Gained	689	596	289	221

- A. Yes, all the rates are equal to  $\frac{1}{13.25}$ .
- B. Yes, all the rates are equal to  $\frac{1}{14.9}$ .
- C. Yes, all the rates are equal to  $\frac{1}{17}$ .
- D.** No, the rates are not equal.



**EXAMPLE****Describe Proportional Relationships**

- 2 WORK** Nina charges \$5 for each day of pet sitting. Write an equation relating the cost of pet sitting to the number of days. What would be the cost of pet sitting for 4 days?

Find the constant of proportionality.

**Words** \$5 for each day of pet sitting



**Variable** Let  $d$  = number of days of pet sitting and  $c$  = total amount Nina charges.



**Equation**  $c = 5d$

**EXAMPLE****Describe Proportional Relationships**

$$\begin{aligned} 2 \quad c &= 5d \\ &= 5(4) \\ &= 20 \end{aligned}$$

Write the equation.

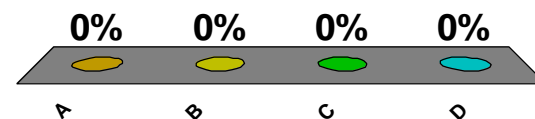
Replace  $d$  with the number of days.

Multiply.

**Answer:**  $c = 5d$ ; \$20

 **CHECK** Your Progress

- 2** **MUSIC** Lindsay paid \$10.89 to download an album with 11 songs. Write an equation relating cost to the number of songs downloaded. How much would an album of 13 songs cost?
- A.** The cost  $c$  is related to the number of songs  $s$  by the equation  $c = 0.99s$ . An album of 13 songs would cost \$12.87.
- B.** The cost  $c$  is related to the number of songs  $s$  by the equation  $c = 0.99s$ . An album of 13 songs would cost \$13.99.
- C.** The cost  $c$  is related to the number of songs  $s$  by the equation  $c = 1.01s$ . An album of 13 songs would cost \$13.13.
- D.** The cost  $c$  is related to the number of songs  $s$  by the equation  $c = 1.01s$ . An album of 13 songs would cost \$12.12.





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# Lesson Menu

Five-Minute Check (over Lesson 6-2)

Main Ideas and Vocabulary

Key Concept: Proportion

Key Concept: Property of Proportions

Example 1: Solve Proportions

Example 2: Real-World Example

Example 3: Convert Measurements

## Main Ideas

- Solve proportions.
- Use proportions to solve real-world problems.

## New Vocabulary

- proportion
- cross products

**KEY CONCEPT***Proportion*

**Word** A proportion is an equation stating that two ratios or rates are equal.

**Symbols**  $\frac{a}{b} = \frac{c}{d}$

**Example**  $\frac{2}{3} = \frac{6}{9}$

**KEY CONCEPT***Property of Proportions*

**Words** The cross products of a proportion are equal.

**Symbols** If  $\frac{a}{b} = \frac{c}{d}$ , then  $ad = bc$ . If  $ad = bc$ , then  $\frac{a}{b} = \frac{c}{d}$ .

**EXAMPLE** Solve Proportions

**1** A. Solve the proportion  $\frac{c}{36} = \frac{9}{15}$ .

$$\frac{c}{36} = \frac{9}{15}$$

$$c \cdot 15 = 36 \cdot 9$$

$$15c = 324$$

$$\frac{15c}{15} = \frac{324}{15}$$

$$c = 21.6$$

Cross products

Multiply.

Divide.

**Answer:** The solution is 21.6.

**EXAMPLE** Solve Proportions

**1** B. Solve the proportion  $\frac{16}{v} = \frac{4.8}{1.5}$ .

$$\frac{16}{v} = \frac{4.8}{1.5}$$

$$16 \bullet 1.5 = 4.8 \bullet v$$

$$24 = 4.8v$$

$$\frac{24}{4.8} = \frac{4.8v}{4.8}$$

$$5 = v$$

Cross products

Multiply.

Divide.

**Answer:** The solution is 5.

 **CHECK Your Progress**

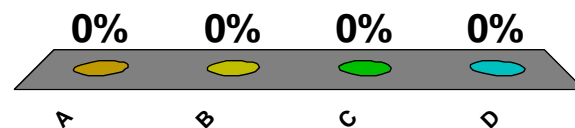
1 A. Solve  $\frac{x}{12} = \frac{3}{8}$ .

A. 32

B. 4

**C.** 4.5

D. 36





 **CHECK Your Progress**

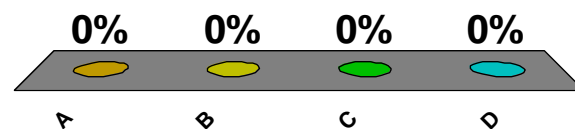
1 B. Solve  $\frac{5}{m} = \frac{3}{4.2}$ .

A. 7

B. 21

C. 3.6

D. 30



**Real-World EXAMPLE**

- 2 ARCHITECTURE** An architect builds a model of a building before the actual building is built. The model is 8 inches tall and the actual building will be 22 feet tall. The model is 20 inches wide. Find the width of the actual building.

**Explore** You know the actual height of the building and the corresponding height of the model. You need to find the actual width of the building that corresponds with a model width of 20 inches.

**Plan** Write and solve a proportion using ratios that compare the actual building to the model. Let  $w$  represent the actual width of the building.

**Real-World EXAMPLE****2 Solve**

$$\frac{\text{actual height}}{\text{model height}} = \frac{\text{actual width}}{\text{model width}}$$

$$\frac{22}{8} = \frac{w}{20}$$

$$22 \cdot 20 = 8 \cdot w$$

$$440 = 8w$$

$$\frac{440}{8} = \frac{8w}{8}$$

$$55 = w$$

Write a proportion.

Cross products

Multiply.

Divide.

Simplify.

**Real-World EXAMPLE**

**2 Answer:** The actual width of the building is 55 feet.

**Examine** Check the cross products. Since  $8 \bullet 55 = 440$  and  $22 \bullet 20 = 440$ , the answer is correct.

 **CHECK Your Progress**

- 2 PLANES** A model of a jet airplane has a length of 9 inches and a wingspan of 6 inches. Find the wingspan of the actual plane if the length is 120 feet.
- A. 180 ft
- B.** 80 ft
- C. 720 ft
- D. 18 ft

0%

 A  B  C  D


**Real-World EXAMPLE**
**Convert Measurements**

- 3** **ATTRACTIONS** The Circleville Pumpkin Show in Circleville, Ohio, boasts the world's largest pumpkin pie. The pie weighs 350 pounds and is 5 feet in diameter. Find the diameter of the pie in centimeters if 1 foot = 30.48 centimeters.

Let  $x$  represent the diameter in centimeters.

$$\begin{array}{l} \text{customary measurement} \rightarrow 1 \text{ ft} \\ \text{metric measurement} \rightarrow 30.48 \text{ cm} \end{array} = \frac{5 \text{ ft}}{x \text{ cm}} \begin{array}{l} \leftarrow \text{customary measurement} \\ \leftarrow \text{metric measurement} \end{array}$$

$$1 \bullet x = 30.48 \bullet 5 \quad \text{Cross products}$$

$$x = 152.4 \quad \text{Simplify.}$$

**Answer:** The diameter of the pie is 152.4 centimeters.

 **CHECK** Your Progress

**3** **SCHOOL** The gymnasium in a new school building measures 55 feet in length. Find the length of the gymnasium in centimeters if  $1 \text{ ft} = 30.48 \text{ centimeters}$ .

**A.** 1676.4 cm

0%

**B.** 1.8 cm

**C.** 0.55 cm

**D.** 1804.5 cm

 A  B  C  D

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# Lesson Menu

Five-Minute Check (over Lesson 6-3)

Main Ideas and Vocabulary

Example 1: Find Actual Measurements

Example 2: Determine the Scale

Example 3: Construct a Scale Drawing

## Main Ideas

- Use scale drawings.
- Construct scale drawings.

## New Vocabulary

- scale drawing
- scale model
- scale
- scale factor


**Real-World EXAMPLE**
**Find Actual Measurements**

- 1 MAP** A map has a scale of 1 inch = 8 miles. Two towns are 3.25 inches apart on the map. What is the actual distance between the two towns?

**Method 1** Use a proportion.

Let  $x$  represent the actual distance between the two towns. Write and solve a proportion.

$$\begin{array}{l} \text{map distance} \rightarrow \frac{1 \text{ inch}}{8 \text{ miles}} = \frac{3.25 \text{ inches}}{x \text{ miles}} \leftarrow \text{map distance} \\ \text{actual distance} \rightarrow \end{array}$$

$$1 \bullet x = 8 \bullet 3.25 \quad \text{Find the cross products.}$$

$$x = 26 \quad \text{Simplify.}$$

**Answer:** The actual distance between the two towns is 26 miles.

**Real-World EXAMPLE****Find Actual Measurements**

**1 Method 2** Use the Unit Rate.

The actual distance is proportional to the map distance with a ratio of  $\frac{1 \text{ inch}}{8 \text{ miles}}$ .

Find the scale factor.

$$\frac{1 \text{ inch}}{8 \text{ miles}} = \frac{1 \text{ inch}}{506,880 \text{ inches}}$$

Convert 8 miles to inches.

**Real-World EXAMPLE****Find Actual Measurements**

- 1 The scale factor is  $\frac{1}{506,880}$ . So, the actual distance is 506,880 times the map distance ( $a = 506,880m$ ).

$$a = 506,880m$$

$$= 506,880(3.25)$$

$$= 1,647,360$$

Write the equation.

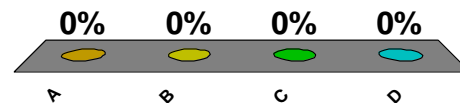
Substitute  $m = 3.25$

Simplify.

**Answer:** The actual distance is 1,647,360 inches or 26 miles.

 **CHECK** Your Progress

- 1 SCALE DRAWING** A scale drawing of a new house has a scale of 1 inch = 4 feet. The height of the living room ceiling is 2.75 inches on the scale drawing. What is the actual height of the ceiling?
- A. 1.45 feet
  - B. 48 feet
  - C. 11 feet**
  - D. 6.88 feet



**Real-World EXAMPLE****Determine the Scale**

- 2 MODEL CAR** A model car is 4 inches long. The actual car is 12 feet long. What is the scale of the model?

Write the ratio of the length of the model to the actual length of the car. Then solve a proportion in which the length of the model is 1 inch and the actual length is  $x$  feet.

$$\begin{array}{l} \text{model length} \rightarrow \frac{4 \text{ inches}}{12 \text{ feet}} = \frac{1 \text{ inch}}{x \text{ feet}} \leftarrow \text{model length} \\ \text{actual length} \rightarrow \end{array}$$

$$4 \bullet x = 12 \bullet 1 \quad \text{Find the cross products.}$$

$$4x = 12 \quad \text{Simplify.}$$

**Real-World EXAMPLE****Determine the Scale****2**

$$\frac{4x}{4} = \frac{12}{4}$$

Divide each side by 4.

$$x = 3$$

Simplify.

**Answer:** The scale is 1 inch = 3 feet.



 **CHECK** Your Progress

**2** **LOG CABIN** A model log cabin is 12 inches high. The actual log cabin is 42 feet high. What is the scale of the model?

- A.** 1 inch = 3.5 feet
- B.** 1 inch = 42 feet
- C.** 2 inches = 7 feet
- D.** 1 inch = 3.5 inches

0%

 A  B  C  D


**Real-World EXAMPLE**
**Construct a Scale Drawing**

- 3 PATIO DESIGN** Sheila is designing a patio that is 16 feet long and 14 feet wide. Make a scale drawing of the patio. Use a scale of 0.5 inch = 4 feet.

**Step 1** Find the measure of the patio's length on the drawing. Let  $x$  represent the length.

$$\begin{array}{l} \text{drawing length} \rightarrow \frac{0.5 \text{ inch}}{4 \text{ feet}} = \frac{x \text{ inches}}{16 \text{ feet}} \leftarrow \text{drawing length} \\ \text{actual length} \rightarrow \end{array}$$

$$0.5 \cdot 16 = 4 \cdot x$$

$$8 = 4x$$

$$2 = x$$

Find the cross products.

Simplify.

Divide each side by 4.

**Real-World EXAMPLE****Construct a Scale Drawing**

- 3** On the drawing, the length is 2 inches.

**Step 2** Find the measure of the patio's width on the drawing. Let  $w$  represent the width.

$$\begin{array}{l} \text{drawing length} \rightarrow \frac{0.5 \text{ inch}}{4 \text{ feet}} = \frac{w \text{ inches}}{14 \text{ feet}} \leftarrow \text{drawing length} \\ \text{actual length} \rightarrow \end{array}$$

$$0.5 \cdot 16 = 4 \cdot x \quad \text{Find the cross products.}$$

$$7 = 4w \quad \text{Simplify.}$$

**Real-World EXAMPLE****Construct a Scale Drawing****3**

$$\frac{7}{4} = \frac{4w}{4}$$

Divide each side by 4.

$$1.75 = w$$

Simplify.

On the drawing, the width is 1.75 or  $1\frac{3}{4}$  inches.

**Real-World EXAMPLE****Construct a Scale Drawing**

**3** **Step 3** Make the scale drawing.

Use  $\frac{1}{4}$ -inch grid paper. Since 2 inches =

8 squares and  $1\frac{3}{4}$  inches = 7 squares, draw

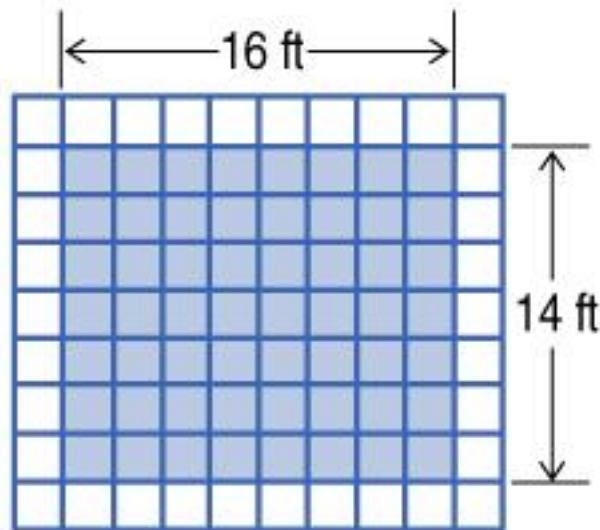
a rectangle that is 8 squares by 7 squares.



**Real-World EXAMPLE**

**Construct a Scale Drawing**

**3** Answer:



 **CHECK Your Progress**

**3** **GARDENING** Bob is designing a garden that is 18 feet long and 14 feet wide. Make a scale drawing of the garden. Use a scale of 0.5 inch = 4 feet.

**A.** The length is  $2\frac{1}{4}$  inches = 6 squares and the width is  $1\frac{3}{4}$  inches = 5 squares.

0%

**B.** The length is  $2\frac{1}{4}$  inches = 9 squares and the width is  $1\frac{3}{4}$  inches = 7 squares.

**C.** The length is  $1\frac{1}{8}$  inches =  $4\frac{1}{2}$  squares and the width is  $\frac{7}{8}$  inches =  $3\frac{1}{2}$  squares.

**D.** The length is  $1\frac{1}{2}$  inches = 6 squares and the width is  $1\frac{1}{4}$  inches = 5 squares.

 A  B  C  D

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# Lesson Menu

Five-Minute Check (over Lesson 6-4)

Main Ideas and Vocabulary

Example 1: Percents as Fractions

Example 2: Fractions as Percents

Key Concept: Percents and Decimals

Example 3: Percents as Decimals

Example 4: Decimals as Percents

Example 5: Fractions as Percents

Example 6: Compare Numbers

## Main Ideas

- Express percents as fractions and vice versa.
- Express percents as decimals and vice versa.

## New Vocabulary

- percent

**EXAMPLE** Percents as Fractions

- 1 A. Express 40% as a fraction in simplest form.

$$40\% = \frac{40}{100}$$

$$= \frac{2}{5}$$

Answer:  $\frac{2}{5}$

**EXAMPLE** Percents as Fractions

- 1** B. Express 104% as a fraction in simplest form.

$$\begin{aligned} 104\% &= \frac{104}{100} \\ &= \frac{26}{25} \text{ or } 1\frac{1}{25} \end{aligned}$$

**Answer:**  $\frac{26}{25}$  or  $1\frac{1}{25}$

**EXAMPLE** Percents as Fractions

- 1 C. Express 0.3% as a fraction in simplest form.

$$\begin{aligned}0.3\% &= \frac{0.3}{100} \\ &= \frac{0.3}{100} \cdot \frac{10}{10} \\ &= \frac{3}{1000}\end{aligned}$$

Multiply by  $\frac{10}{10}$  to eliminate the decimal in the numerator.

**Answer:**  $\frac{3}{1000}$

**EXAMPLE****Percents as Fractions**

- 1** D. Express  $56\frac{1}{4}\%$  as a fraction in simplest form.

$$\begin{aligned}56\frac{1}{4}\% &= \frac{56\frac{1}{4}}{100} \\ &= 56\frac{1}{4} \div 100\end{aligned}$$

**Answer:**  $\frac{9}{16}$

 **CHECK Your Progress**

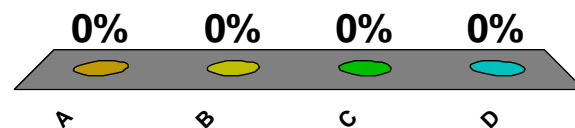
1 A. Express 35% as a fraction in simplest form.

A.  $\frac{35}{100}$

B.  $\frac{1}{3}$

**C.**  $\frac{7}{20}$

D.  $3\frac{1}{2}$



 **CHECK Your Progress**

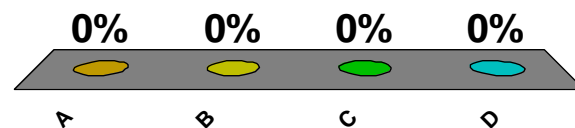
**1 B.** Express 160% as a fraction in simplest form.

**A.**  $1\frac{3}{5}$

**B.**  $\frac{4}{25}$

**C.**  $1\frac{60}{100}$

**D.** 16





 **CHECK Your Progress**

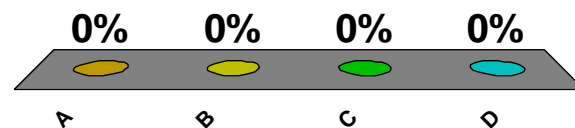
1 C. Express 0.8% as a fraction in simplest form.

A.  $\frac{8}{1000}$

**B.**  $\frac{1}{125}$

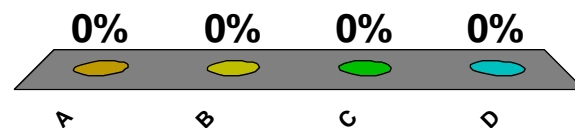
C.  $\frac{2}{25}$

D. 8



 **CHECK Your Progress**

- 1 D. Express  $32\frac{1}{2}\%$  as a fraction in simplest form.
- A.  $32\frac{1}{2}$
- B.**  $\frac{13}{40}$
- C.  $\frac{65}{1000}$
- D. 325



**EXAMPLE****Fractions as Percents**

**2** A. Express  $\frac{19}{20}$  as a percent.

$$\frac{19}{20} = \frac{95}{100} \text{ or } 95\%$$

**Answer:** 95%

**EXAMPLE****Fractions as Percents**

**2** B. Express  $\frac{8}{5}$  as a percent.

$$\frac{8}{5} = 160 \text{ or } 160\%$$

**Answer:** 160%

 **CHECK Your Progress**

2 A. Express  $\frac{17}{25}$  as a percent.

A. 68%

B. 4.25%

C. 0.68%

D. 85%

0%



A  B  C  D



 **CHECK Your Progress**

**2** B. Express  $\frac{14}{10}$  as a percent.

A. 14%

B.  $1\frac{2}{5}\%$

**C.** 140%

D. 1.4%

0%



A  B  C  D



**KEY CONCEPT***Percents and Decimals*

- To write a percent as a decimal, divide by 100 and remove the percent symbol.
- To write a decimal as a percent, multiply by 100 and add the percent symbol.

**EXAMPLE** Percents as Decimals

**3** A. Express 60% as a decimal.

$$60\% = \overset{\curvearrowright}{60}\%$$

$$= 0.60$$

Divide by 100 and remove the %.

**Answer:** 0.60



**EXAMPLE****Percents as Decimals**

**3** B. Express 7% as a decimal.

7% = 07% Divide by 100 and remove the %.

$$= 0.07$$

**Answer:** 0.07

**EXAMPLE** Percents as Decimals

**3** C. Express 658% as a decimal.

$$\begin{aligned} 658\% &= \underbrace{658\%}_{\text{Divide by 100 and remove the \%}} \\ &= 6.58 \end{aligned}$$

**Answer:** 6.58

**EXAMPLE** Percents as Decimals

**3** D. Express 0.4% as a decimal.

$$\begin{aligned} 0.4\% &= \underline{00.4}\% && \text{Divide by 100 and remove the \%} \\ &= 0.004 \end{aligned}$$

**Answer:** 0.004

 **CHECK Your Progress**

**3** A. Express 84% as a decimal.

A. 8.4

**B.** 0.84

C. 8400

D. 840

0%

A  B  C  D



 **CHECK** Your Progress

3 B. Express 7% as a decimal.

A. 0.7

B. 7.0

C. 700

**D. 0.07**

0%

A  B  C  D



 **CHECK Your Progress**

**3** C. Express 302% as a decimal.

A. 30.2

**B.** 3.02

C. 30,200

D. 3,020

0%

A  B  C  D



 **CHECK Your Progress**

**3** D. Express 0.9% as a decimal.

**A.** 0.009

**B.** 0.09

**C.** 90

**D.** 9

0%

A  B  C  D



**EXAMPLE** Decimals as Percents

**4** A. Express 0.4 as a percent.

$$\begin{aligned} 0.4 &= 0.40 \\ &= 40\% \end{aligned}$$

Multiply by 100 and add the %.

**Answer:** 40%



**EXAMPLE** Decimals as Percents

**4** B. Express 0.05 as a percent.

$$\begin{aligned} 0.05 &= 0.05 \\ &= 5\% \end{aligned}$$

Multiply by 100 and add the %.

**Answer:** 5%

**EXAMPLE** Decimals as Percents

- 4 C. Express 0.0008 as a percent.

$$\begin{aligned} 0.0008 &= 0.\underbrace{0008} && \text{Multiply by 100 and add the \%} \\ &= 0.08\% \end{aligned}$$

**Answer:** 0.08%

**EXAMPLE** Decimals as Percents

- 4 D. Express 7.3 as a percent.

$$\begin{aligned} 7.3 &= 7.\underline{30} \\ &= 730\% \end{aligned}$$

Multiply by 100 and add the %.

**Answer:** 730%

 **CHECK Your Progress**

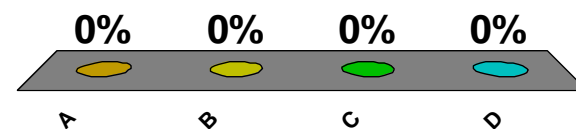
4 A. Express 0.84 as a percent.

A. 0.84%

B. 8.4%

**C.** 84%

D. 0.0084%



 **CHECK Your Progress**

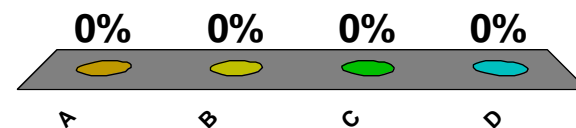
4 B. Express 0.01 as a percent.

A. 0.1%

B. 10%

C. 0.0001%

**D. 1%**



 **CHECK Your Progress**

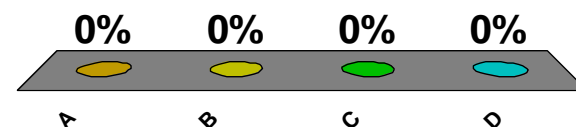
4 C. Express 0.004 as a percent.

A. 0.4%

B. 4%

C. 0.04%

D. 0.0004%



 **CHECK Your Progress**

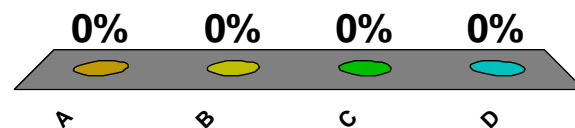
4 D. Express 2.39 as a percent.

A. 239%

B. 2.39%

C. 23900%

D. 23.9%



**EXAMPLE** Fractions as Percents

- 5** A. Express  $\frac{5}{8}$  as a percent. Round to the nearest tenth percent, if necessary.

$$\begin{aligned}\frac{5}{8} &= 0.625 \\ &= 62.5\%\end{aligned}$$

**Answer:** 62.5%



**EXAMPLE** Fractions as Percents

- 5 B.** Express  $\frac{1}{3}$  as a percent. Round to the nearest tenth percent, if necessary.

$$\frac{1}{3} = 0.\underbrace{333333}\dots$$
$$\approx 33.3\%$$

**Answer:** 33.3%

**EXAMPLE** Fractions as Percents

- 5** C. Express  $\frac{9}{1000}$  as a percent. Round to the nearest tenth percent, if necessary.

$$\begin{aligned}\frac{9}{1000} &= 0.009 \\ &= 0.9\%\end{aligned}$$

**Answer:** 0.9%

**EXAMPLE** Fractions as Percents

- 5** D. Express  $\frac{23}{14}$  as a percent. Round to the nearest tenth percent, if necessary.

$$\frac{23}{14} \approx 1.6428571$$

$$\approx 164.3\%$$

**Answer:** 164.3%

 **CHECK Your Progress**

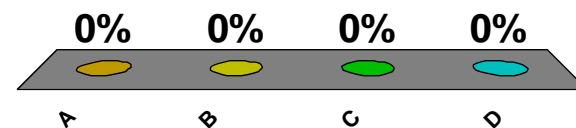
**5** A. Express  $\frac{3}{8}$  as a percent. Round to the nearest tenth percent, if necessary.

A. 3.8%

**B.** 37.5%

C. 0.375%

D. 380%



 **CHECK Your Progress**

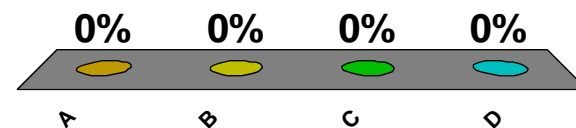
**5** **B.** Express  $\frac{5}{12}$  as a percent. Round to the nearest tenth percent, if necessary.

**A.** 512%

**B.** 0.417%

**C.** 41.7%

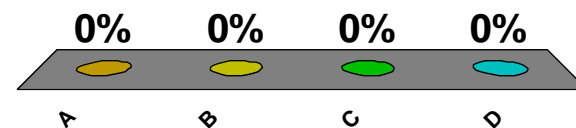
**D.** 5.12%



 **CHECK Your Progress**

5 C. Express  $\frac{13}{1000}$  as a percent. Round to the nearest tenth percent, if necessary.

- A. 1.3%
- B. 13%
- C. 13.1%
- D. 0.13%



 **CHECK Your Progress**

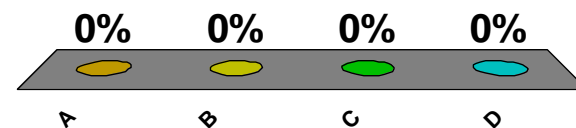
**5** **D.** Express  $\frac{21}{17}$  as a percent. Round to the nearest tenth percent, if necessary.

**A.** 21.17%

**B.** 123.5%

**C.** 2117%

**D.** 1.235%



**Real-World EXAMPLE****Compare Numbers**

- 6 BAKERY** A baker said that 25% of his customers buy only bread and  $\frac{2}{5}$  of his customers buy only cookies. Which group is larger?

Write  $\frac{2}{5}$  as a percent. Then compare.

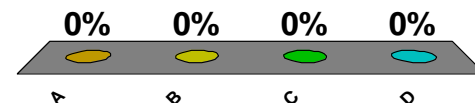
$$\frac{2}{5} = 0.40 \text{ or } 40\%$$

**Answer:** Since 40% is greater than 25%, the group that buys only cookies is larger.



 **CHECK Your Progress**

- 6 SCHOOL** The school principal states that  $\frac{3}{8}$  of the students are involved in instrumental music while 42% are involved in vocal music. Which group is larger?
- A.** vocal music
  - B.** instrumental music
  - C.** the groups are equal in size
  - D.** cannot be determined



# End of the Lesson

Click the mouse button to return to the  
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# Lesson Menu

Five-Minute Check (over Lesson 6-5)

Main Idea and Vocabulary

Key Concept: Percent Proportion

Example 1: Find the Percent

Example 2: Find the Part

Example 3: Find the Whole

Example 4: Apply the Percent Proportion

Concept Summary: Types of Percent Problems

## Main Idea

- Use the percent proportion to solve problems.

## New Vocabulary

- percent proportion

## KEY CONCEPT

*Percent Proportion*

**Words**  $\frac{\text{part}}{\text{whole}} = \frac{\text{percent}}{100}$

**Symbols**  $\frac{a}{b} = \frac{p}{100}$ , where  $a$  is the part,  $b$  is the whole or base, and  $p$  is the percent.

**EXAMPLE** Find the Percent**1** A. Twenty is what percent of 25?

Twenty is being compared to 25. So, 20 is the part and 25 is the whole. Let  $n$  represent the percent.

$$\frac{20}{25} = \frac{n}{100}$$

Write the percent proportion.

$$20 \cdot 100 = 25 \cdot n$$

Find the cross products.

$$2000 = 25n$$

Simplify.

**EXAMPLE** Find the Percent

$$\textcircled{1} \quad \frac{2000}{25} = \frac{25n}{25}$$

Divide each side by 25.

$$80 = n$$

Simplify.

**Answer:** 20 is 80% of 25.

**EXAMPLE** Find the Percent**1** B. What percent of 8 is 12?

Twelve is being compared to 8. So, 12 is the part and 8 is the whole. Let  $n$  represent the percent.

$$\frac{12}{8} = \frac{n}{100}$$

Write the percent proportion.

$$12 \cdot 100 = 8 \cdot n$$

Find the cross products.

$$1200 = 8n$$

Simplify.



**EXAMPLE** Find the Percent

$$\textcircled{1} \quad \frac{1200}{8} = \frac{8n}{8}$$

Divide each side by 8.

$$150 = n$$

Simplify.

**Answer:** 150% of 8 is 12.

 **CHECK** Your Progress

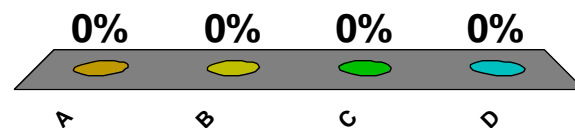
1 A. Twelve is what percent of 40?

A. 333%

**B.** 30%

C. 4.8%

D. 3.33%



 **CHECK** Your Progress

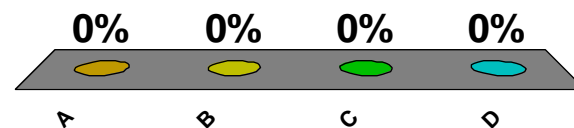
1 B. What percent of 20 is 35?

A. 1.75%

B. 7%

C. 57%

**D. 175%**



**EXAMPLE** Find the Part**2** What number is 8.8% of 20?

The percent is 8.8, and the whole is 20. Let  $n$  represent the part.

$$\frac{n}{20} = \frac{8.8}{100}$$

$$n \cdot 100 = 20 \cdot 8.8$$

$$100n = 176$$

$$n = 1.76$$

Write the percent proportion.

Find the cross products.

Simplify.

Mentally divide each side by 100.

**Answer:** 8.8% of 20 is 1.76.

 **CHECK Your Progress**

2 What number is 42.5% of 90?

A. 2.12

B. 0.47

**C.** 38.25

D. 3825

0%



A  B  C  D



**EXAMPLE** Find the Whole**3** Seventy is 28% of what number?

The percent is 28%, and the part is 70. Let  $n$  represent the whole.

$$\frac{70}{n} = \frac{28}{100}$$

Write the percent proportion.

$$70 \cdot 100 = n \cdot 28$$

Find the cross products.

$$7000 = 28n$$

Simplify.

**EXAMPLE** Find the Whole**3**

$$\frac{7000}{28} = \frac{28n}{28}$$

Divide each side by 28.

$$250 = n$$

Simplify.

**Answer:** 70 is 28% of 250.

 **CHECK Your Progress**

**3** Ninety is 24% of what number?

A. 21.6

**B.** 375

C. 2160

D. 26.67

0%

A  B  C  D





**Real-World EXAMPLE****Apply the Percent Proportion**

- 4 TENNIS** From the years 1999 through 2005, Serena Williams won the U.S. Open Tennis Championships two times and Wimbledon two times. What percent of both tournaments combined during those years was Serena Williams the women's champion? Round to the nearest tenth.

Compare the number of Serena Williams' wins, 4, to the total number of tournaments played, 14. The part is 4 and the whole is 14. Let  $n$  represent the percent.

**Real-World EXAMPLE****Apply the Percent Proportion****4**

$$\frac{4}{14} = \frac{n}{100}$$

$$4 \cdot 100 = 14 \cdot n$$

$$400 = 14n$$

$$\frac{400}{14} = \frac{14n}{14}$$

$$28.6 \approx n$$

Find the cross products.

Simplify.

Divide each side by 14.

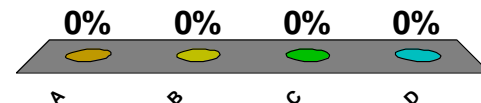
Simplify.

**Answer:** Serena Williams won about 28.6% of the tournaments.

 **CHECK** Your Progress

**4** **BAKE SALE** At the school bake sale, 23 chocolate chip cookies, 18 oatmeal raisin cookies, and 7 peanut butter cookies were sold. If the sale started with a total of 90 cookies, what percent of the cookies were sold?

- A.** 53.3%
- B.** 7.8%
- C.** 1.9%
- D.** 48%



## CONCEPT SUMMARY

*Types of Percent Problems*

Type	Example	Proportion
Find the Percent	3 is <u>what percent</u> of 4? or <u>What percent</u> of 4 is 3?	$\frac{3}{4} = \frac{n}{100}$
Find the Part	<u>What number</u> is 75% of 4?	$\frac{n}{4} = \frac{75}{100}$
Find the Whole	3 is 75% of <u>what number</u> ?	$\frac{3}{n} = \frac{75}{100}$

# End of the Lesson

Click the mouse button to return to the  
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# Lesson Menu

Five-Minute Check (over Lesson 6-6)

Main Ideas

Concept Summary: Percent-Fraction Equivalents

Example 1: Find Percent of a Number Mentally

Example 2: Estimate Percents

Example 3: Real-World Example

## Main Ideas

- Compute mentally with percents.
- Estimate with percents.

## CONCEPT SUMMARY

*Percent-Fraction Equivalents*

$20\% = \frac{1}{5}$	$10\% = \frac{1}{10}$	$25\% = \frac{1}{4}$	$12\frac{1}{2}\% = \frac{1}{8}$	$16\frac{2}{3}\% = \frac{1}{6}$
$40\% = \frac{2}{5}$	$30\% = \frac{3}{10}$	$50\% = \frac{1}{2}$	$37\frac{1}{2}\% = \frac{3}{8}$	$33\frac{1}{3}\% = \frac{1}{3}$
$60\% = \frac{3}{5}$	$70\% = \frac{7}{10}$	$75\% = \frac{3}{4}$	$62\frac{1}{2}\% = \frac{5}{8}$	$66\frac{2}{3}\% = \frac{2}{3}$
$80\% = \frac{4}{5}$	$90\% = \frac{9}{10}$		$87\frac{1}{2}\% = \frac{7}{8}$	$83\frac{1}{3}\% = \frac{5}{6}$



**EXAMPLE** Find Percent of a Number Mentally

**1** A. Find 50% of 46 mentally.

$$50\% \text{ of } 46 = \frac{1}{2} \text{ of } 46 \quad \text{Think: } 50\% = \frac{1}{2}.$$

$$= 23 \quad \text{Think: } \frac{1}{2} \text{ of } 46 \text{ is } 23.$$

**Answer:** 50% of 46 is 23.

**EXAMPLE** Find Percent of a Number Mentally

**1** B. Find 25% of 88 mentally.

$$\begin{array}{l} 25\% \text{ of } 88 = \frac{1}{4} \text{ of } 88 \\ = 22 \end{array} \quad \begin{array}{l} \text{Think: } 25\% = \frac{1}{4}. \\ \text{Think: } \frac{1}{4} \text{ of } 88 \text{ is } 22. \end{array}$$

**Answer:** 25% of 88 is 22.

**EXAMPLE** Find Percent of a Number Mentally**1** C. Find 70% of 110 mentally.

$$\begin{aligned}70\% \text{ of } 110 &= \frac{7}{10} \text{ of } 110 \\ &= 77\end{aligned}$$

$$\text{Think: } 70\% = \frac{7}{10}.$$

$$\text{Think: } \frac{1}{10} \text{ of } 110 \text{ is } 11.$$

$$\text{So, } \frac{7}{10} \text{ of } 110 \text{ is } 77.$$

**Answer:** 70% of 110 is 77.

 **CHECK Your Progress**

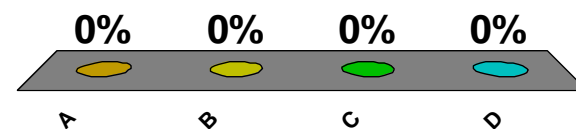
**1** A. Find 50% of 82 mentally.

**A.** 41

**B.** 164

**C.** 16

**D.** 40



 **CHECK Your Progress**

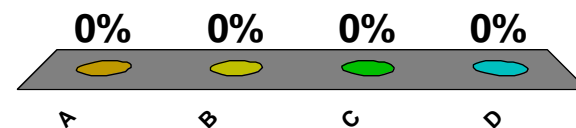
**1** B. Find 25% of 36 mentally.

A. 144

B. 10

C. 90

**D. 9**



 **CHECK Your Progress**

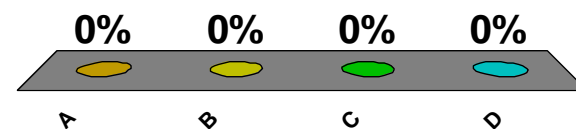
1 C. Find 80% of 60 mentally.

A. 12

B. 50

**C.** 48

D. 480



**EXAMPLE** Estimate Percents

**2** A. Estimate 22% of 494.

22% is about 20% or  $\frac{1}{5}$ .

494 is about 500.

$\frac{1}{5}$  of 500 is 100.

**Answer:** 22% of 494 is about 100.

**EXAMPLE** Estimate Percents

**2** B. Estimate  $\frac{1}{4}\%$  of 1219.

$$\frac{1}{4}\% = \frac{1}{4} \times 1\%. \text{ 1219 is about 1200.}$$

1% of 1200 is 12.

**Answer :**  $\frac{1}{4}\%$  of 1219 is about  $\frac{1}{4} \times 12$  or 3.



**EXAMPLE** Estimate Percents**2** C. Estimate 155% of 38.

155% means about 150 for every 100 or about 15 for every 10.

38 has about 4 tens.

$$15 \times 4 = 60$$

**Answer:** 155% of 38 is about 60.

 **CHECK Your Progress**

**2** A. Estimate 38% of 400.

A. 100

B. 152

**C.** 160

D. 80

0%



A  B  C  D



 **CHECK Your Progress**

2 B. Estimate  $\frac{1}{5}$  % of 2482.

A. 25

B. 4.964

C. 4

**D. 5**

0%



A  B  C  D



 **CHECK Your Progress**

**2** C. Estimate 183% of 93.

**A.** 162

**B.** 157.2

**C.** 170.19

**D.** 180

0%

A  B  C  D



**Real-World EXAMPLE**

- 3 MONEY** A restaurant bill totals \$21.35. You want to leave a 15% tip. What is a reasonable amount for the tip?

\$21.35 is about \$21.

$15\% = 10\% + 5\%$

10% of \$21 is \$2.10

Move the decimal point 1 place to the left.

5% of \$21 is \$1.05

5% is one half of 10%.

So, 15% is about \$2.10 + \$1.05 or \$3.15.

**Answer:** A reasonable amount for the tip would be \$3.

 **CHECK** Your Progress

**3** **MONEY** A restaurant bill totals \$59.05. You want to leave a 15% tip. What is a reasonable amount for the tip?

A. \$8.90

**B.** \$9

C. \$12

D. \$6

0%

A  B  C  D



# End of the Lesson

Click the mouse button to return to the  
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# Lesson Menu

Five-Minute Check (over Lesson 6-7)

Main Ideas and Vocabulary

Concept Summary: The Percent Equation

Example 1: Find the Part

Example 2: Find the Percent

Example 3: Find the Whole

Example 4: Find Discount

Example 5: Apply Simple Interest Formula



## Main Ideas

- Solve percent problems using percent equations.
- Solve real-life problems involving discount and interest.

## New Vocabulary

- percent equation
- discount
- interest

## CONCEPT SUMMARY

*The Percent Equation*

Type	Example	Equation
Missing Part	<u>What number</u> is 75% of 4?	$n = 0.75(4)$
Missing Percent	3 is <u>what percent</u> of 4?	$3 = n(4)$
Missing Whole	3 is 75% of <u>what number</u> ?	$3 = 0.75n$

**EXAMPLE** Find the Part

**1** Find 38% of 22.      Estimate: 40% of 20 is 8.

**Words**      What number is 38% of 22?



**Variable**      Let  $n$  represent the number.



**Equation**      part = percent • whole or  $n = 0.38 \bullet 22$

$n = 0.38(22)$  or 8.36      Multiply. Compare to the estimate. Is the answer reasonable?

**Answer:** 38% of 22 is 8.36.

 **CHECK** Your Progress

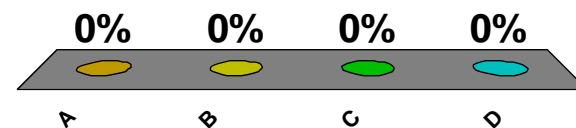
1 Find 64% of 48.

A. 32

B. 75

**C.** 30.72

D. 30



**EXAMPLE** Find the Percent**2** 19 is what percent of 25?

Estimate:

$$\frac{19}{25} \approx \frac{4}{5}, \text{ which is } 80\%.$$

You know that the whole is 25 and the part is 19.  
Let  $n$  represent the percent.

$$19 = n(25)$$

$$\frac{19}{25} = n$$

Divide each side by 25.

**EXAMPLE****Find the Percent**

**2**  $0.76 = n$

Simplify.

**Answer:** 19 is 76% of 25

The answer makes sense compared to the estimate.

 **CHECK Your Progress**

**2** 8 is what percent of 25?

A. 312%

B.  $33\frac{1}{3}\%$

**C.** 32%

D. 2%

0%



A  B  C  D



**EXAMPLE** Find the Whole**3** 84 is 16% of what number?**Estimate:**  
80 is 16% of 500.

You know that the part is 84 and the percent is 16%. Let  $n$  represent the base.

$$84 = 0.16n$$

Write 16% as the decimal 0.16.

$$\frac{84}{0.16} = \frac{0.16n}{0.16}$$

Divide each side by 0.16.



**EXAMPLE****Find the Whole**

**3**  $525 = n$

Simplify

**Answer:** 84 is 16% of 525. The answer is reasonable since it is close to the estimate.

 **CHECK Your Progress**

**3** 315 is 42% of what number?

**A.** 750

**B.** 132.3

**C.** 13.33

**D.** 150

0%

A  B  C  D



**Real-World EXAMPLE****Find Discount**

- 4 JEWELRY** The regular price of a ring is \$495. It is on sale at a 20% discount. What is the sale price of the ring?

**Method 1**

First, use the percent equation to find 20% of 495.

Let  $d$  represent the discount.

$$\begin{aligned}d &= 0.20(495) \\ &= 99\end{aligned}$$

**Estimate :**  $\frac{1}{5}$  of 500 = 100

The whole is 495 and the percent is 20.  
Simplify.

**Real-World EXAMPLE****Find Discount**

- 4 Then, find the sale price.

$495 - 99 = 396$  Subtract the discount from the original price.

**Method 2**

A discount of 20% means the ring will cost  $100\% - 20\%$  or 80% of the original price. Use the percent equation to find 80% of 495.

Let  $s$  represent the sale price.

**Real-World EXAMPLE****Find Discount**

$$4 \quad s = 0.80(495)$$

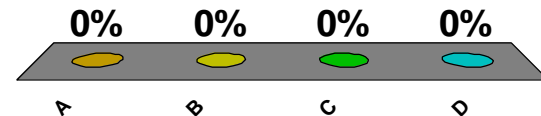
The whole is 495 and the percent is 80%.

$$s = 396$$

**Answer:** The sale price of the ring will be \$396.

 **CHECK** Your Progress

- 4** **RETAIL** The regular price of a stereo system is \$1295. The system is on sale at a 15% discount. Find the sale price of the stereo system.
- A. \$194.25
  - B. \$1100.75**
  - C. \$1170.00
  - D. \$1489.25



**Real-World EXAMPLE****Apply Simple Interest Formula**

- 5 BANKING** Suppose you invest \$2000 at an annual interest rate of 4.5%. How long will it take for it to earn \$495 in interest?

$$I = prt$$

Write the simple interest formula.

$$495 = 2000(0.045)t$$

Replace  $I$  with 495,  $p$  with 2000, and  $r$  with 0.045.

$$495 = 90t$$

Simplify.

**Real-World EXAMPLE****Apply Simple Interest Formula**

$$5 \quad \frac{495}{90} = \frac{90t}{90}$$

$$5.5 = t$$

Divide each side by 90.

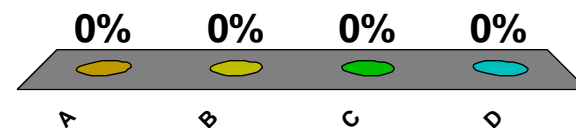
Simplify.

**Answer:** It will take 5.5 years to earn \$495.



 **CHECK** Your Progress

- 5** **BANKING** Suppose you invest \$3500 at an annual interest rate of 6.25%. How long will it take for it to earn \$875?
- A. 64 years
- B. 55 years
- C.** 4 years
- D. 0.4 years



# End of the Lesson

Click the mouse button to return to the  
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Chapter  
RESOURCES



# Lesson Menu

Five-Minute Check (over Lesson 6-8)

Main Ideas and Vocabulary

Example 1: Find Percent of Change

Example 2: Find Percent of Increase

Example 3: Standardized Test Example

Example 4: Find Percent of Decrease

## Main Ideas

- Find percent of increase.
- Find percent of decrease.

## New Vocabulary

- percent of change
- percent of increase
- percent of decrease

**EXAMPLE** Find Percent of Change

**1** Find the percent of change from 325 to 390.

**Step 1** Subtract to find the amount of change.  
 $390 - 325 = 65$  new amount – original amount

**Step 2** Write a ratio that compares the amount of change to the original amount. Express the ratio as a percent.

$$\begin{aligned} \text{percent of change} &= \frac{\text{amount of change}}{\text{original amount}} \\ &= \frac{65}{325} \quad \text{Substitution.} \end{aligned}$$

**EXAMPLE****Find Percent of Change****1**

$$= 0.20 \text{ or } 20\%$$

Write the decimal  
as a percent.

**Answer:** The percent of change from 325 to 390 is  
20%.

 **CHECK Your Progress**

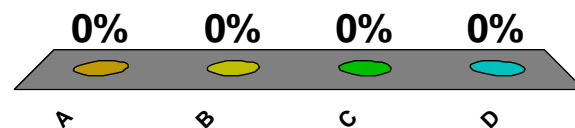
**1** Find the percent of change from 84 to 105.

A. 20%

**B.** 25%

C. 75%

D. 80%



**Real-World EXAMPLE****Find Percent of Increase**

- 2 TUITION** In 1965, when John entered college, the tuition per year was \$7500. In 2005, when his daughter went to the same school, the tuition was \$25,500. Find the percent of change.

**Step 1** Subtract to find the amount of change.

$$25,500 - 7500 = 18,000 \text{ new tuition} - \text{original tuition}$$

**Step 2** Write a ratio that compares the amount of change to the original tuition. Express the ratio as a percent.

$$\text{percent of change} = \frac{\text{amount of change}}{\text{original tuition}}$$



**Real-World EXAMPLE****Find Percent of Increase****2**

$$= \frac{18,000}{7500}$$

Substitution.

$$= 2.4 \text{ or } 240\%$$

Write the decimal as a percent.

**Answer:** The percent of change is 240%. In this case, the percent of change is a percent of increase.

 **CHECK** Your Progress

**2** **TEXTBOOKS** In 1990, the price of a textbook was \$38. In 2000, the price of the same textbook was \$81. Find the percent of change.

- A. 47%
- B. 53%
- C. 113%**
- D. 213%

0%

 A  B  C  D



## Standardized Test EXAMPLE

- 3 Refer to the table shown. Which city had the least percent of increase in population from 1990 to 2000?

City	1990	2004
Anaheim	266,406	333,776
Burbank	93,643	104,114
Monterey	31,954	29,669
San Jose	782,248	904,522

Source: U.S. Census Bureau

A Anaheim

B Burbank

C Monterey

D San Jose

**Standardized Test EXAMPLE****3 Read the Test Item**

Percent of increase tells how much the population has increased in relation to 1990.

**Solve the Test Item**

Use a ratio to find each percent of increase. Then compare the percents.



## Standardized Test EXAMPLE

**3** • Anaheim

$$\frac{333,776 - 266,406}{266,406} = \frac{67,370}{266,406}$$
$$\approx 0.2529 \text{ or } 25.3\%$$

## • Burbank

$$\frac{104,114 - 93,643}{93,643} = \frac{10,471}{93,643}$$
$$\approx 0.1118 \text{ or } 11.2\%$$

**Standardized Test EXAMPLE****3** • **Monterey**

Eliminate this choice because the population decreased.

• **San Jose**

$$\frac{904,522 - 782,248}{782,248} = \frac{122,274}{782,248}$$
$$\approx 0.1563 \text{ or } 15.6\%$$

**Answer:** Burbank had the least percent of increase in population from 1990 to 2004. The answer is B.

 **CHECK Your Progress**

- 3** The table shows test scores on the first two math tests of the semester for four students. Which student had the greatest percent of increase from test 1 to test 2?

Student	Test 1 Score	Test 2 Score
Holly	84	91
Ben	93	89
Sally	65	79
Max	73	98

0%

A. Holly

B. Ben

C. Sally

**D. Max** A  B  C  D

**Real-World EXAMPLE****Find Percent of Decrease**

- 4 CLOTHING** A \$110 sweater is on sale for \$88. What is the percent of change?

**Step 1** Subtract to find the amount of change.  
 $88 - 110 = -22$  sale price – original price

**Step 2** Compare the amount of change to the original price.

$$\text{percent of change} = \frac{\text{amount of change}}{\text{original price}}$$



**Real-World EXAMPLE****Find Percent of Decrease****4**

$$= \frac{-22}{110}$$

Substitution.

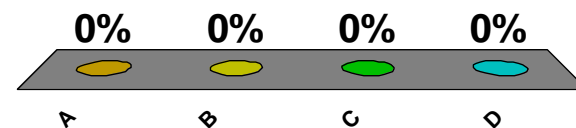
$$= -0.20 \text{ or } -20\%$$

Write the decimal as a percent.

**Answer:** The percent of change is  $-20\%$ . In this case, the percent of change is a percent of decrease.

 **CHECK** Your Progress

- 4 **SHOES** A \$145 pair of tennis shoes is on sale for \$105. What is the percent of change?
- A. 27.6%
- B. -27.6%**
- C. -38.1%
- D. -72.4%



# End of the Lesson

Click the mouse button to return to the  
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# Lesson Menu

Five-Minute Check (over Lesson 6-9)

Main Ideas and Vocabulary

Concept Summary: Unbiased Samples

Concept Summary: Biased Samples

Example 1: Identify and Describe Samples

Example 2: Use Sampling to Predict

## Main Ideas

- Identify various sampling techniques.
- Determine the validity of a sample and predict the actions of a larger group.

## New Vocabulary

- sample
- population
- unbiased sample
- simple random sample
- stratified random sample
- systematic random sample
- biased sample
- convenience sample
- voluntary response sample

## CONCEPT SUMMARY

*Unbiased Samples*

Type	Definition	Example
<b>Simple Random Sample</b>	a sample where each item or person in a population is as likely to be chosen as any other	Thirty student ID numbers are randomly selected by a computer.
<b>Stratified Random Sample</b>	a sample in which the population is divided into similar, nonoverlapping groups. A simple random sample is then selected from each group.	Five students are chosen with birthdays in the same month, for each of the 12 months.
<b>Systematic Random Sample</b>	a sample in which the items or people are selected according to a specific time or item interval	Every 20 minutes a customer is chosen. or Every 10th customer in line is chosen.

## CONCEPT SUMMARY

*Biased Samples*

Type	Definition	Example
<b>Convenience Sample</b>	a sample which includes members of the population that are easily accessed	City council surveys residents within 1-mile of a park whether to add a recreation center to the park.
<b>Voluntary Response Sample</b>	a sample which involves only those who want to participate in the sampling	The school board sent an email to graduating seniors asking them where to hold commencement. Seniors are asked to vote through an online poll.

**EXAMPLE** Identify and Describe Samples

- 1** A. Mr. Ackerman needs several volunteers to collect homework before each class. He randomly calls out a color and whoever is wearing that color is chosen. Identify this sample as biased or unbiased and describe its type.

**Answer:** unbiased, stratified random sample.

**Concepts in Motion**

Interactive Lab:

Probability

[Click here to view!](#)



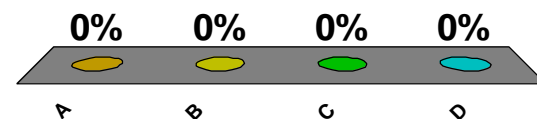
**EXAMPLE** Identify and Describe Samples

- 1 B.** A hardware store wants feedback on their products and service. They include a telephone number on each receipt so customers can voluntarily call and participate.

**Answer:** biased, both voluntary and convenience

 **CHECK Your Progress**

- 1 To determine the leading candidate for governor, all of the registered voters in one district are called and asked who they favor. Is the sample *biased* or *unbiased*? Describe its type.
- A. unbiased; simple random sample
  - B. unbiased; systematic random sample
  - C. biased; convenience sample**
  - D. biased; voluntary response sample



**Real-World EXAMPLE****Using Sampling to Predict**

- 2** **A. SPORTS** Miss Newman surveyed every tenth student in the hallway to see which sports they preferred watching. 44% preferred football, 28% basketball, 20% soccer, and 8% tennis. Is this sampling method valid? If so, out of 560 students in the entire school, how many would you expect to say they preferred watching basketball?

This is an unbiased, systematic random sample since Miss Newman selected students according to a specific interval. So, this sampling method is valid. Since 28% of those surveyed preferred watching basketball, to find how many would say they preferred watching basketball in the entire school, find 28% of 560.

**Real-World EXAMPLE****Using Sampling to Predict**

**2 Words** What number is 28% of 560?



**Variable** Let  $n$  = the number of students preferring to watch basketball.



**Equation**  $n = 0.28 \times 560$

$$n = 0.28 \times 560$$

$$= 156.8 \quad \text{Multiply.}$$

**Answer:** yes; 157 students

**Real-World EXAMPLE****Using Sampling to Predict**

- 2 B. MUSIC** A middle school planned to play music during lunch. Fifty students were randomly surveyed and asked what type of music they preferred. Sixteen said they wanted country music. Is this sampling method valid? If there were 535 students, how many would you expect to prefer country music?

**Answer:** yes; 171 students

 **CHECK** Your Progress

**2** **A. COLORS** To determine favorite colors, students wearing either blue or red were surveyed. 32% preferred blue, 29% preferred red, 23% preferred yellow, and 16% preferred green. Is this sampling method valid? If so, out of 450 students in the entire school, how many would you expect to say they prefer red?

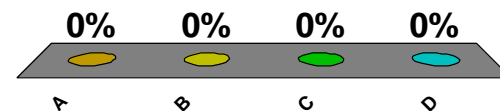
- A. yes; 144 students
- B. yes; 29 students
- C. yes; 131 students
- D. no; invalid sample**

0%

 A  B  C  D

 **CHECK Your Progress**

- 2** **B. EDUCATION** The board of a school system consisting of 22 elementary schools, 6 middle schools and 4 high schools is considering three possible weeks for spring break for the upcoming school year. The board surveyed three randomly-chosen teachers from each school. Of the teachers surveyed, 84 chose the first week of April. Is this sampling method valid? If so, about how many of the 848 teachers in the school district would choose the first week of April?
- A. The survey is invalid because this is a convenience sample.
- B. The survey is invalid because this is a voluntary response sample.
- C. The survey is valid because this is a simple random sample. Of all the teachers, 106 would choose the first week of April.
- D.** The survey is valid because this is a stratified random sample. Of all the teachers, 742 would choose the first week of April.



# End of the Lesson

Click the mouse button to return to the  
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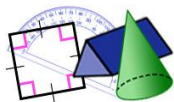


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 **Five-Minute CHECK**

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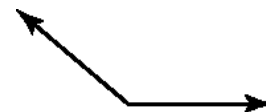
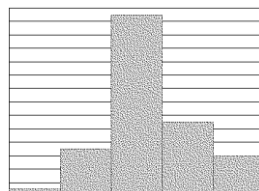
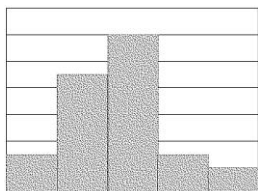
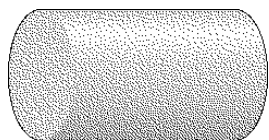
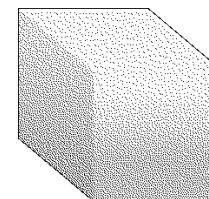
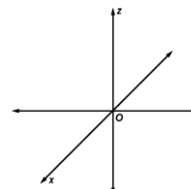
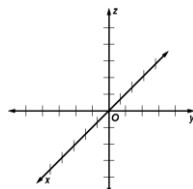
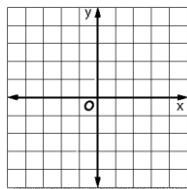
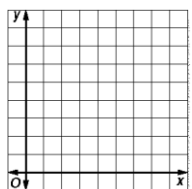
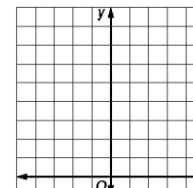
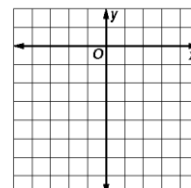
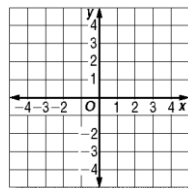
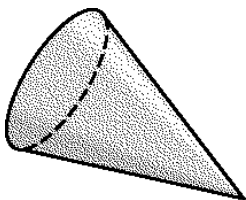
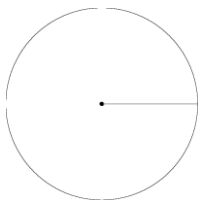
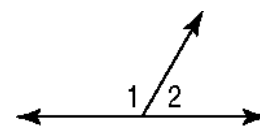
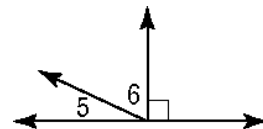
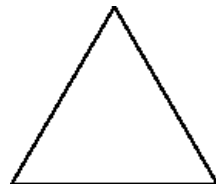
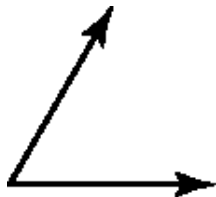
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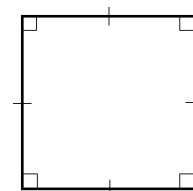
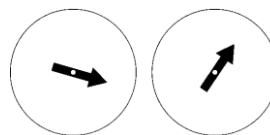
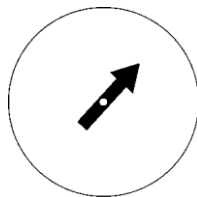
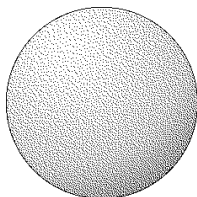
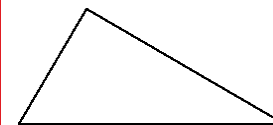
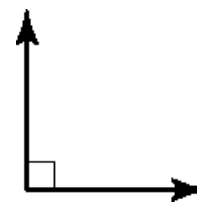
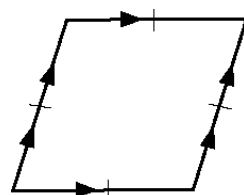
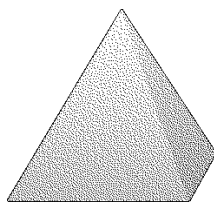
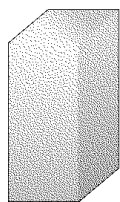
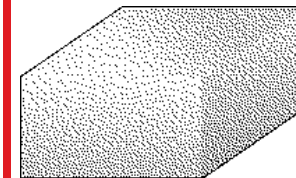
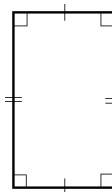
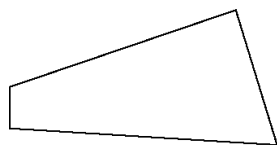
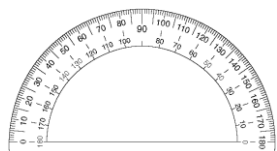
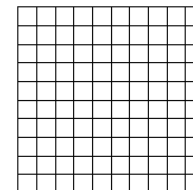
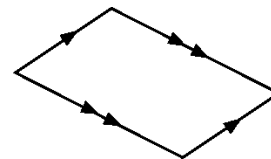
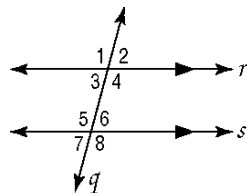
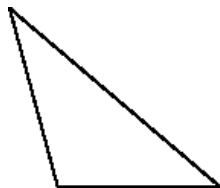
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2. Open a chapter presentation using a full installation of Microsoft® PowerPoint® in editing mode and scroll to the Image Bank slides.
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# Image Bank

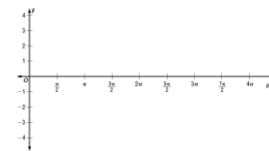
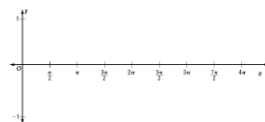
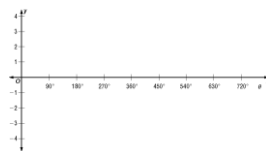
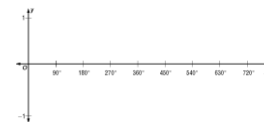
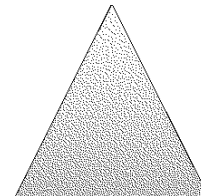
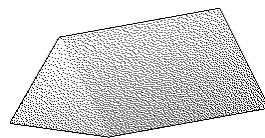
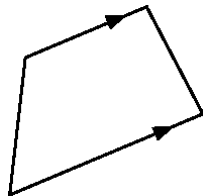
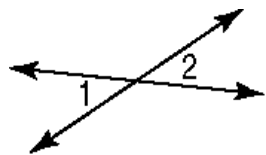


# Image Bank



Stem	Leaf

## Image Bank



**CO**ncepts in **MO**tion *Animation*



## Five-Minute CHECK

(over Chapter 5)

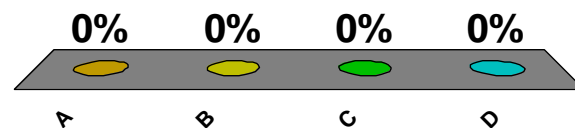
1 Write  $3\frac{3}{8}$  as a decimal.

A. 3.375

B. 3.125

C. 1.75

D. 1.125







## Five-Minute CHECK

(over Chapter 5)

2 Write  $-0.05$  as a fraction in simplest form.

A.  $-\frac{1}{50}$

B.  $-\frac{1}{5}$

**C.**  $-\frac{1}{20}$

D.  $-\frac{1}{2}$

0%

 A  B  C  D



## Five-Minute CHECK

(over Chapter 5)

3 Solve  $\frac{2}{3}x = \frac{8}{9}$ .

A.  $x = 1\frac{5}{9}$

**B.**  $x = 1\frac{1}{3}$

C.  $x = \frac{16}{27}$

D.  $x = \frac{2}{9}$

0%

 A  B  C  D



## Five-Minute CHECK

(over Chapter 5)

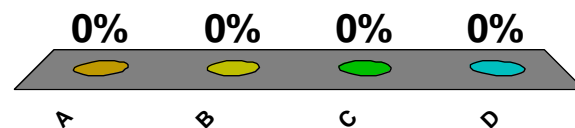
4 Solve  $n - \frac{3}{4} = 1\frac{1}{2}$ .

A.  $n = 2\frac{1}{4}$

B.  $n = \frac{1}{2}$

C.  $n = 1\frac{1}{8}$

D.  $n = \frac{3}{4}$





## Five-Minute CHECK

(over Chapter 5)

**5** In a survey of students,  $\frac{13}{25}$  of the girls and  $\frac{11}{20}$  of the boys have a pet. Does a greater fraction of girls or boys have a pet?

**A.**  $\frac{13}{25} = 0.5$  and  $\frac{11}{20} = 0.5$ . Because  $0.5 = 0.5$ , an equal fraction of both girls and boys has a pet.

**B.**  $\frac{13}{25} = 0.52$  and  $\frac{11}{20} = 0.55$ . Because  $0.52 > 0.55$ , a greater fraction of girls has a pet.

**C.**  $\frac{13}{25} = 0.55$  and  $\frac{11}{20} = 0.52$ . Because  $0.55 > 0.52$ , a greater fraction of girls has a pet.

**D.**  $\frac{13}{25} = 0.52$  and  $\frac{11}{20} = 0.55$ . Because  $0.55 > 0.52$ , a greater fraction of boys has a pet.

0%

A B C D





## Five-Minute CHECK

(over Chapter 5)

## Standardized Test Practice

- 6 Which statement is true about  $\{6, 2, 7, 3, 4, 6, 2, 4, 2\}$ ?
- A. The mean and the mode are the same number.
- B. The median and the mode are the same number.
- C. The mean and the median are the same number.
- D. The median, the mean, and the mode are different numbers.

0%

 A  B  C  D



## Five-Minute CHECK

(over Lesson 6-1)

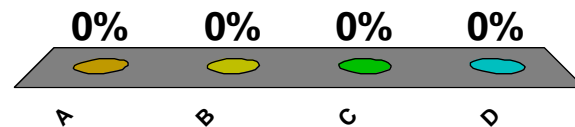
- 1 Express the ratio as a fraction in simplest form.  
10 tulips to 18 daffodils

A.  $\frac{10}{18}$

**B.**  $\frac{5}{9}$

C.  $\frac{18}{10}$

D.  $\frac{9}{5}$





## Five-Minute CHECK

(over Lesson 6-1)

- 2 Express the ratio as a fraction in simplest form.  
5 yards to 10 feet

A.  $\frac{1}{6}$

B.  $\frac{1}{2}$

**C.**  $\frac{3}{2}$

D. 2

0%

 A  B  C  D



## Five-Minute CHECK

(over Lesson 6-1)

- 3** Express the ratio as a unit rate. Round to the nearest tenth, if necessary. 230 miles in 4.5 hours
- A. 0.5 mi/h
- B. 5.1 mi/h
- C. 50 mi/h
- D.** 51.1 mi/h

0%

 A  B  C  D

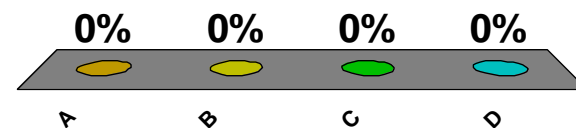




## Five-Minute CHECK

(over Lesson 6-1)

- 4 Express the ratio as a unit rate. Round to the nearest tenth, if necessary. 54 pages in 30 minutes
- A. 1.8 pages/min
- B. 1.5 pages/min
- C. 0.8 pages/min
- D. 0.5 pages/min



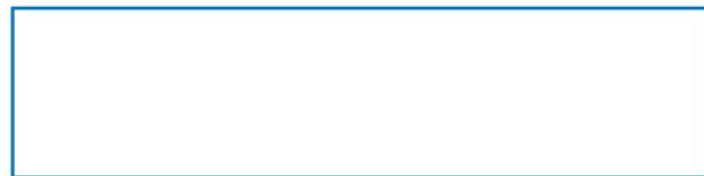


## Five-Minute CHECK

(over Lesson 6-1)

- 5 Refer to the figure.  
Express the ratio of the  
width to the length as a  
fraction in simplest form.

9 inches



3 feet

- A.  $\frac{1}{4}$
- B.  $\frac{1}{3}$
- C. 3
- D. 4

0%

 A  B  C  D



## Five-Minute CHECK

(over Lesson 6-1)

## Standardized Test Practice

- 6 What is the cost per pound for a 20-ounce box of cereal that sells for \$4.50?
- A. \$2.25
- B. \$3.60**
- C. \$4.50
- D. \$5.63

0%

 A  B  C  D



## Five-Minute CHECK

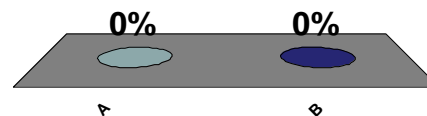
(over Lesson 6-2)

- 1 Determine whether the sets of numbers in the table are proportional.

A. yes

B. no

Time (s)	Distance (feet)
5	23
10	28
15	33
20	38





## Five-Minute CHECK

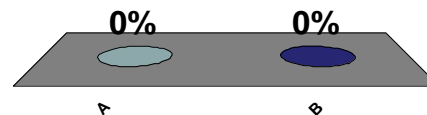
(over Lesson 6-2)

- 2 Determine whether the sets of numbers in the table are proportional.

A. yes

B. no

Whole pizzas	Slices of pizza
1	8
2	16
3	24
4	32





## Five-Minute CHECK

(over Lesson 6-2)

- 3** A deli sells 3 pounds of sliced meat for \$20.85. Write an equation relating cost  $c$  to the number of pounds  $p$  of meat.

**A.**  $c = 6.95p$

0%

**B.**  $p = 6.95c$

**C.**  $c = 0.695p$

**D.**  $p = 0.695c$

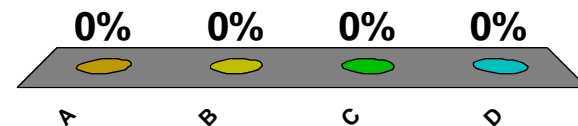
 A  B  C  D



## Five-Minute CHECK

(over Lesson 6-2)

- 4 A deli sells 3 pounds of sliced meat for \$20.85. How much is 5 pounds of meat?
- A. \$30.00
- B. \$32.50
- C. \$34.75**
- D. \$35.00



**Five-Minute CHECK**

(over Lesson 6-2)

**Standardized Test Practice**

- 5** A gear inside a clock makes 20 revolutions every 30 minutes. Which of these represents an equivalent rate of gear revolutions?
- A. 25 revolutions in 40 minutes
- B.** 30 revolutions in 45 minutes
- C. 35 revolutions in 50 minutes
- D. 40 revolutions in 55 minutes

0%

 A  B  C  D





## Five-Minute CHECK

(over Lesson 6-3)

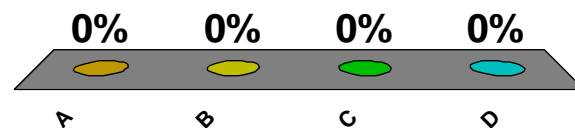
1 Solve the proportion  $\frac{x}{9} = \frac{20}{45}$ .

A.  $x = \frac{4}{81}$

B.  $x = \frac{1}{4}$

C.  $x = 4$

D.  $x = \frac{81}{4}$





## Five-Minute CHECK

(over Lesson 6-3)

2 Solve the proportion  $\frac{14}{3} = \frac{42}{n}$ .

A.  $n = 1$

**B.**  $n = 9$

C.  $n = \frac{1}{9}$

D.  $n = \frac{1}{28}$

0%

 A  B  C  D



## Five-Minute CHECK

(over Lesson 6-3)

- 3** Write a proportion that could be used to solve for the variable and then solve. 18 donuts in 3 boxes, 30 donuts in  $b$  boxes

**A.**  $\frac{18}{3} = \frac{30}{b}; 5$

0%

**B.**  $\frac{18}{3} = \frac{b}{30}; 6$

**C.**  $\frac{3}{18} = \frac{30}{b}; 6$

**D.**  $\frac{18}{3} = \frac{b}{30}; 5$

 A  B  C  D



## Five-Minute CHECK

(over Lesson 6-3)

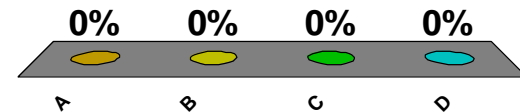
- 4 Write a proportion that could be used to solve for the variable and then solve. 5 pounds of meat for \$17.45,  $p$  pounds of meat for \$10.47

A.  $\frac{5}{17.5} = \frac{10.47}{p}; 5$

B.  $\frac{5}{p} = \frac{17.45}{10.47}; 5$

C.  $\frac{5}{p} = \frac{10.47}{17.45}; 3$

D.  $\frac{5}{17.45} = \frac{p}{10.47}; 3$





## Five-Minute CHECK

(over Lesson 6-3)

- 5 There are approximately 2.54 centimeters in 1 inch. Write a proportion that could be used to find the length, in inches, of a meter stick (100 centimeters). What is the length, in inches, of a meter stick?

A.  $\frac{2.54}{1} = \frac{100}{x}$ ; 39.37 in.

B.  $\frac{1}{2.54} = \frac{100}{x}$ ; 254 in.

C.  $\frac{2.54}{100} = \frac{1}{x}$ ; 39.37 in.

D.  $\frac{2.54}{1} = \frac{x}{100}$ ; 254 in.

0%

A B C D





## Five-Minute CHECK

(over Lesson 6-3)

## Standardized Test Practice

- 6 There are 35 red and blue marbles in a bag. The ratio of blue marbles to red marbles is 2 to 5. Which proportion could be used to find the number of red marbles in the bag?

0%

A.  $\frac{2}{5} = \frac{r}{35}$

B.  $\frac{2}{7} = \frac{r}{35}$

C.  $\frac{5}{7} = \frac{r}{35}$

D.  $\frac{5}{35} = \frac{7}{r}$

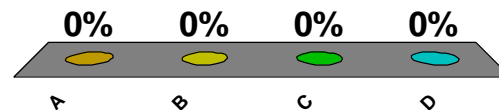
 A  B  C  D



## Five-Minute CHECK

(over Lesson 6-4)

- 1 On a floor plan for a new house, the scale is  $\frac{1}{2}$  inch = 2 feet. Find the actual length of the master bedroom which is 5 inches on the floor plan.
- A. 5 feet
- B. 10 feet
- C. 15 feet
- D. 20 feet





## Five-Minute CHECK

(over Lesson 6-4)

**2** On a floor plan for a new house, the scale is  $\frac{1}{2}$  inch = 2 feet. Find the actual length of the living room which is  $3\frac{1}{4}$  inches on the floor plan.

**A.** 13 feet

**B.** 10 feet

**C.** 8 feet

**D.** 3 feet

0%

 A  B  C  D



**Five-Minute CHECK**

(over Lesson 6-4)

**3** On a floor plan for a new house, the scale is  $\frac{1}{2}$  inch = 2 feet. Find the actual length of the kitchen which is 2.8 inches on the floor plan.

A. 22.4 feet

0%

**B.** 11.2 feet

C. 5.6 feet

D. 2.8 feet

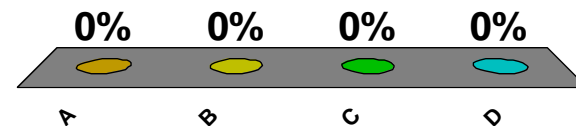
A  B  C  D



**Five-Minute CHECK**

(over Lesson 6-4)

- 4** On a map the distance between two cities is 4.5 inches. The actual distance is 270 miles. What is the scale of the map?
- A.** 1 mile = 121.5 inches
- B.** 1 mile = 60 inches
- C.** 1 inch = 121.5 miles
- D.** 1 inch = 60 miles





## Five-Minute CHECK

(over Lesson 6-4)

- 5** A flower garden is 3 feet wide by 8 feet long. What will be the width and length of the garden on a scale drawing if the scale is  $\frac{1}{4}$  inch = 1 foot?
- A. 12 inches wide; 32 inches long
- B.  $\frac{3}{4}$  inch wide; 32 inches long
- C.**  $\frac{3}{4}$  inch wide; 2 inches long
- D. 2 inches wide; 12 inches long

0%

A B C D





## Five-Minute CHECK

(over Lesson 6-4)

## Standardized Test Practice

6 Which scale has a scale factor of  $\frac{1}{15}$ ?

A. 1 in. = 5 ft

**B.** 4 in. = 5 ft

C. 6 in. = 10 ft

D. 15 in. = 15 ft

0%

 A  B  C  D



## Five-Minute CHECK

(over Lesson 6-5)

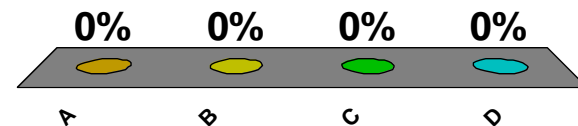
1 Express the fraction  $\frac{11}{40}$  as a percent. Round to the nearest tenth percent, if necessary.

A. 27.5%

B. 4.4%

C. 2.8%

D. 22.0%





## Five-Minute CHECK

(over Lesson 6-5)

- 2 Express the decimal 0.007 as a percent. Round to the nearest tenth percent, if necessary.
- A. 70 percent
- B. 7 percent
- C. 0.7 percent**
- D. 0.07 percent

0%

 A  B  C  D



## Five-Minute CHECK

(over Lesson 6-5)

**3** Express 32% as a decimal and as a fraction in simplest form.

A.  $0.32; \frac{25}{8}$

B.  $3.12; \frac{25}{8}$

C.  $3.12; \frac{8}{25}$

**D.**  $0.32; \frac{8}{25}$

0%

 A  B  C  D



## Five-Minute CHECK

(over Lesson 6-5)

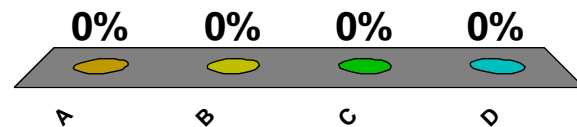
4 Express 6% as a decimal and as a fraction in simplest form.

A.  $0.006; \frac{3}{50}$

**B.**  $0.06; \frac{3}{50}$

C.  $0.6; \frac{3}{50}$

D.  $6.00; \frac{3}{50}$







## Five-Minute CHECK

(over Lesson 6-5)

- 5 Choose the greatest number in the set.

$$\left\{ 38\%, \frac{2}{5}, 0.35, 1 \text{ out of } 3 \right\}$$

A. 1 out of 3

B. 38 percent

C.  $\frac{2}{5}$

D. 0.35

0%

A  B  C  D





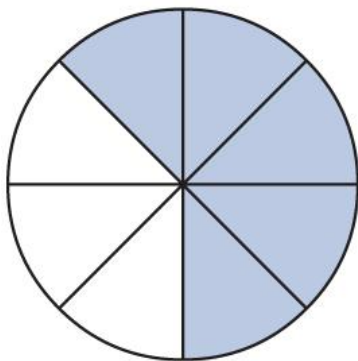
## Five-Minute CHECK

(over Lesson 6-5)

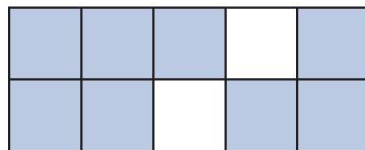
## Standardized Test Practice

6 Which figure has the greatest part of its area shaded?

A.

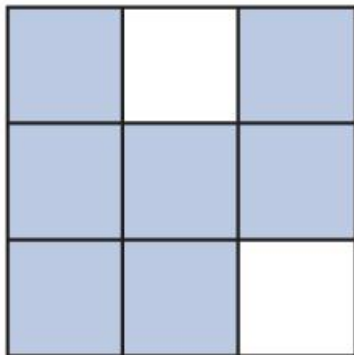


B.

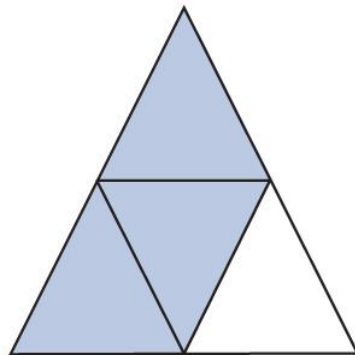


0%

C.



D.


 A  B  C  D




## Five-Minute CHECK

(over Lesson 6-6)

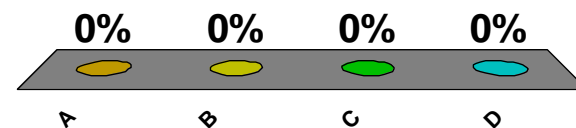
1 18 is what percent of 75? Use the percent proportion to solve the problem.

A. 0.04%

B. 0.24%

**C. 24%**

D. 41%





## Five-Minute CHECK

(over Lesson 6-6)

**2** 14 is 40% of what number? Use the percent proportion to solve the problem.

A. 28

**B.** 35

C. 56

D. 96

0%

 A  B  C  D



## Five-Minute CHECK

(over Lesson 6-6)

**3** What is 56% of 125? Use the percent proportion to solve the problem.

A. 45

B. 60

**C.** 70

D. 81

0%

A  B  C  D

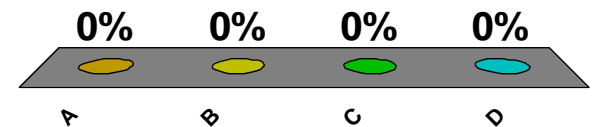




## Five-Minute CHECK

(over Lesson 6-6)

- 4 24.5 is what percent of 98? Use the percent proportion to solve the problem.
- A. 25%
- B. 4%
- C. 0.25%
- D. 0.04%



**Five-Minute CHECK**

(over Lesson 6-6)

- 5** At a bake sale, 63 cookies were sold. This was 75% of the number of cookies baked. How many cookies were baked?
- A. 19 cookies
- B. 21 cookies
- C. 47 cookies
- D.** 84 cookies

0%

A B C D





## Five-Minute CHECK

(over Lesson 6-6)

## Standardized Test Practice

- 6 Twenty-four of 30 students in a class met their goal in the pizza sale. What percent of the students did not meet their goal in the sale?
- A. 80%
- B. 76%
- C. 20%**
- D. 6%

0%

 A  B  C  D





## Five-Minute CHECK

(over Lesson 6-7)

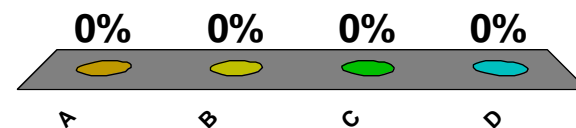
1 Find 125% of 80 mentally.

A. 125

B. 105

**C. 100**

D. 64





## Five-Minute CHECK

(over Lesson 6-7)

2 Find  $33\frac{1}{3}\%$  of 90 mentally.

A. 3

**B. 30**

C. 300

D. 3000

0%

A  B  C  D





## Five-Minute CHECK

(over Lesson 6-7)

- 3** Which of the following state a correct estimate for 79% of 40, along with the method used for estimation?
- A.**  $\frac{4}{5} \bullet 40 = 32$ ; fraction method
- B.**  $0.8 \bullet 80 = 64$ ; 1 percent method
- C.**  $4 \bullet 4 = 16$ ; meaning of percent method
- D.**  $1 \bullet 40 = 40$ ; 1 percent method

0%

 A  B  C  D



## Five-Minute CHECK

(over Lesson 6-7)

**4** Which of the following states a correct estimate for 67% of 120, along with the method used for estimation?

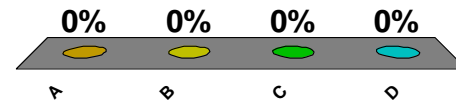
A.  $0.7 \bullet 70 = 49$ ; 1 percent method

B.  $\frac{1}{3} \bullet 120 = 40$ ; fraction method

C.  $(60 \bullet 1) + (6 \bullet 2) = 72$ ;

meaning of percent method

**D.**  $\frac{2}{3} \bullet 120 = 80$ ; fraction method



**Five-Minute CHECK**

(over Lesson 6-7)

**5** In 1990, the population of a town was about 65,000. By 2000, the population increased to about 180% of the 1990 figure. About how many people live in the town in 2000.

**A.** 117,000

**B.** 65,180

**C.** 52,000

**D.** 11,700

0%

 A  B  C  D



## Five-Minute CHECK

(over Lesson 6-7)

## Standardized Test Practice

**6** A store is having a 25%-off sale on all televisions. About how much will a television that regularly sells for \$359 cost?

A. \$90

0%

**B.** \$270

C. \$288

D. \$335

A  B  C  D

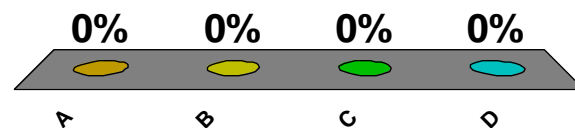




## Five-Minute CHECK

(over Lesson 6-8)

- 1 Solve the problem using the percent equation. 24 is what percent of 80?
- A. 35%
- B. 30%**
- C. 25%
- D. 20%





## Five-Minute CHECK

(over Lesson 6-8)

**2** Solve the problem using the percent equation.  
39 is 52% of what number?

A. 65

B. 68

**C.** 75

D. 78

0%

 A  B  C  D





## Five-Minute CHECK

(over Lesson 6-8)

3 Find 26.3% of 135.

A. 19.481

B. 25.3

C. 33.75

D. 35.505

0%

A  B  C  D

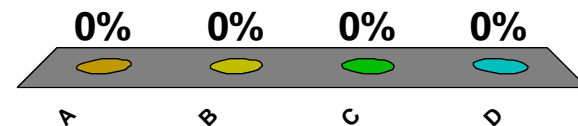




## Five-Minute CHECK

(over Lesson 6-8)

- 4 What is the annual interest rate if \$2500 is invested for 2 years and \$225 in interest is earned?
- A. 5.2%
- B. 4.5%**
- C. 4.2%
- D. 3.5%





## Five-Minute CHECK

(over Lesson 6-8)

- 5** One season the Miami Dolphins had 10 wins. This was 62.5% of the games the team played. How many did they play?
- A. 12
- B. 14
- C.** 16
- D. 18

0%

 A  B  C  D



## Five-Minute CHECK

(over Lesson 6-8)

## Standardized Test Practice

- 6 Refer to the figure. What will be the discount on the price of the mountain bike?

**SALE 15% Off**  
Mountain Bike  
Regular Price \$289

- A. \$43.35
- B. \$45
- C. \$244
- D. \$245.65

0%

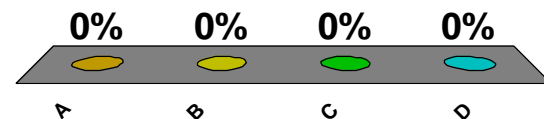
 A  B  C  D



## Five-Minute CHECK

(over Lesson 6-9)

- 1 State whether the change from \$15 to \$18 is a percent of increase or a percent of decrease and find the percent of change. Round to the nearest tenth, if necessary.
- A. percent of decrease;  
-20%
  - B. percent of decrease;  
-16.7%
  - C. percent of increase;  
16.7%
  - D. percent of increase;  
20%



**Five-Minute CHECK**

(over Lesson 6-9)

- 2** State whether the change from 80 lb to 72 lb is a percent of increase or a percent of decrease and find the percent of change. Round to the nearest tenth, if necessary.
- A.** percent of decrease;  
-10%
- B.** percent of decrease;  
-11.1%
- C.** percent of increase;  
10%
- D.** percent of increase;  
11.1%

0%

 A  B  C  D

**Five-Minute CHECK**

(over Lesson 6-9)

- 3** State whether the change from 325 ft to 280 ft is a percent of increase or a percent of decrease and find the percent of change. Round to the nearest tenth, if necessary.

A. percent of decrease;  
-16.1%

**B.** percent of decrease;  
-13.8%

C. percent of increase;  
13.8%

D. percent of increase;  
16.1%

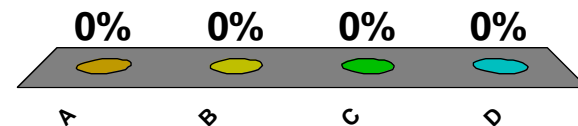
0%

 A  B  C  D

**Five-Minute CHECK**

(over Lesson 6-9)

- 4** Myra bought a new car. Her monthly car payment went from \$294 to \$324. Find the percent of change.
- A.** percent of decrease of 10.2%
  - B.** percent of decrease of 9.25%
  - C.** percent of increase of 10.2%
  - D.** percent of increase of 9.25%







## Five-Minute CHECK

(over Lesson 6-9)

## Standardized Test Practice

- 5 Refer to the table. Which represents the percent of change in the total number of students between the two school years?

Number of Students	2001–2002	2002–2003
6th Grade	420	462
7th Grade	432	422
8th Grade	398	416

- A. 4%
- B. 4.5%
- C. 5%
- D. 10%

0%

 A  B  C  D

